CLAIMS

1. An isolated nucleic acid which comprises a hydroxycinnamoyl-CoA quinate hydroxycinnamoyl transferase (HQT) nucleotide sequence encoding a polypeptide which has HQT activity.

2. A nucleic acid according to claim 1 wherein the HQT nucleotide sequence is obtainable from tomato.

3. A nucleic acid according to claim 1 wherein the HQT nucleotide sequence is obtainable from tobacco.

4. A nucleic acid according to claim 2 wherein the HQT nucleotide sequence encodes a polypeptide with the amino acid sequence shown in SEQ ID No 1.

5. A nucleic acid according to claim 3 wherein the HQT nucleotide sequence encodes a polypeptide with the amino acid sequence shown in SEQ ID No 2.

6. A nucleic acid according to claim 5 wherein the HQT nucleotide sequence has the nucleotide sequence of SEQ ID No 3.

7. A nucleic acid according to claim 6 wherein the HQT nucleotide sequence has the nucleotide sequence of SEQ ID No 4.

8. A nucleic acid comprising a hydroxycinnamoyl-CoA quinate hydroxycinnamoyl transferase (HQT) nucleotide sequence which is a homologous variant of SEQ ID No 3 or SEQ ID No 4 and which shares at least about 85%, 90%, 95%, 96%, 97%, 98% or 99% identity with either.

9. A nucleic acid according to claim 8 wherein said HQT nucleotide sequence encodes a polypeptide which has HQT activity.

10. A nucleic acid according to claim 8 or claim 9 wherein the HQT nucleotide sequence is a derivative of SEQ ID No 3 or SEQ ID No 4 which differs therefrom by way of one or more of nucleotide addition, deletion or substitution.

11. A nucleic acid which comprises a complement HQT nucleotide sequence sequence which is the complement of the HQT nucleotide sequence of any one of claims 1 to 10.

12. An isolated nucleic acid for use as primer, said nucleic acid consisting of a sequence of about 16-32 nucleotides in length, which sequence is present in either the HQT nucleotide sequence of claim 4 or claim 5, or the complement thereof.

13. An isolated nucleic acid for use as a probe, said nucleic acid consisting of a sequence of at least about 100 nucleotides or more, about 200 nucleotides or more, about 300 nucleotides or more, or about 400 nucleotides or more, which contiguous sequence is present in either the HQT nucleotide sequence of claim 6 or claim 7 or the complement thereof.

14. A method for identifying, cloning, or determining the presence of, a nucleic acid as claimed in any of claims 1 to 9, which method employs a nucleic acid as claimed in any one of claims 6, 7, 11, 12 or 13.

15. A method as claimed in claim 14 which comprises the steps of:
(a) providing a preparation of nucleic acid from a plant cell;
(b) providing a nucleic acid molecule which is a nucleic acid as claimed in any one claims 6, 7, 11, 12 or 13;
(c) contacting nucleic acid in said preparation with said nucleic acid molecule under conditions for hybridisation, and,
(d) identifying a nucleic acid variant if present by its hybridisation with said nucleic acid molecule.

16. A method as claimed in claim 15, which method comprises the steps of:
(a) providing a preparation of nucleic acid from a plant cell;
(b) providing a pair of nucleic acid molecule primers suitable for PCR, at least one of said primers being a primer of claim 12,
(c) contacting nucleic acid in said preparation with said primers under conditions for performance of PCR,
(d) performing PCR and determining the presence or absence of an amplified PCR product.

17. A recombinant vector which comprises the nucleic acid of any one of claims 1 to 11.

18. A vector as claimed in claim 17 wherein the nucleic acid is operably linked to a promoter for transcription in a host cell, wherein the promoter is optionally an inducible promoter.

19. A vector as claimed in claim 17 or claim 18 which is a plant vector.

20. A method which comprises the step of introducing the vector of any one of claims 17 to 19 into a host cell, and optionally causing or allowing recombination between the vector and the host cell genome such as to transform the host cell.

21. A host cell containing or transformed with a heterologous nucleic acid of any one of claims 1 to 11 such as to alter one or more of the cell's characteristics with respect to chlorogenic acid synthesis.

22. A host cell as claimed in claim 21 which is a plant cell, optionally present in a plant.

23. A method for producing a transgenic plant, which method comprises the steps of:

(a) performing a method as claimed in claim 20,
(b) regenerating a plant from the transformed plant cell.

24. A transgenic plant which is obtainable by the method of claim 23, or which is a clone, or selfed or hybrid progeny or other descendant of said transgenic plant, which in each case includes the plant cell of claim 22.

25. A part of propagule from a plant as claimed in claim 24, which includes the plant cell of claim 22.

26. An isolated polypeptide which is encoded by the HQT nucleotide sequence of any one of claims 1 to 7, or claim 9.

27. A polypeptide as claimed in claim 26 comprising the amino acid sequence of SEQ ID No 1.

28. A polypeptide as claimed in claim 26 comprising the amino acid sequence of SEQ ID No 2.

29. A polypeptide which comprises the antigen-binding site of an antibody having specific binding affinity for either the polypeptide of claim 27 or claim 28.

30. A method of making the polypeptide of any of claims 26 to 28, which method comprises the step of causing or allowing expression from a nucleic acid of any one of claims 1 to 7 or claim 9 in a suitable host cell.

31. A method for influencing chlorogenic acid levels in a plant, which method comprises the step of causing or allowing expression of a heterologous nucleic acid within the cells of the plant, which nucleic acid comprises a HQT nucleotide sequence or the complement thereof, following an earlier step of introducing the nucleic acid into a cell of the plant or an ancestor thereof.

32. A method according to claim 31, wherein the heterologous nucleic acid is a nucleic acid as claimed in any one of claims 1 to 11.

33. A method according to claim 31, wherein the heterologous nucleic acid comprises the nucleotide sequence of NCBI accession number AB035183.

34. A method as claimed in any one of claims 31 to 33 for increasing the level of chlorogenic acid in a plant to improve any one or more of: flavour; palatability; nutritional value; resistance to abiotic stress; pathogen resistance; antioxidant properties, of the plant.

35. A method as claimed in claim 32 for reducing the level of chlorogenic acid in a plant to improve any one or more of: flavour; palatability; texture; nutritional value, of the plant, which method comprises any of:
(i) causing or allowing transcription from a nucleic acid as claimed in claim 10 in the plant such as to reduce HQT expression by an antisense mechanism, or
(ii) causing or allowing transcription from a nucleic acid as claimed in any one of claims 1 to 9 or a part thereof such as to reduce HQT expression by co-suppression,
(iii) use of double-stranded RNA corresponding to a nucleotide sequence of an HQT nucleotide sequence of any one of claims 1 to 10, or,
(iv) use of nucleic acid encoding a ribozyme specific for a nucleic acid as claimed in any one of claims 1 to 9.